

Bolger Lake

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Land & Water Conservation Department

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Bolger Lake AIS Monitoring and Water Clarity Report

Field Dates: August 5th, 2020
WBIC: 973000
Previous AIS Findings: Chinese Mystery Snail
New AIS Findings: None
Field Crew: Aubrey Nycz, AIS Project Leader, and Rachel Cook, AIS Project Assistant, Oneida County Land and Water Conservation Department
Report By: Rachel Cook

On August 5th, 2020, Aubrey and I went to Bolger Lake for AIS monitoring and to assess water clarity and quality. Bolger Lake is a small 115-acre oligotrophic seepage lake in Oneida County. It has one public boat landing located on the north-eastern side of the lake, off of Bolger Lake Road (seen in Figure 2). The shoreline of Bolger Lake is mostly occupied by private residences, and the eastern perimeter is state-owned land which has a walking trail. The lake has a maximum depth of 45ft, and the substrate is reported to be 65% sand, 5% gravel, 15% rock, and 15% muck. Along with reporting the depth and substrate, the Wisconsin Department of Natural Resources also reports that the lake has musky, largemouth bass, smallmouth bass, walleye, and panfish present.

The weather while conducting research on Bolger Lake was fairly nice. The outside temperature was 65 degrees Fahrenheit, the sky was partly cloudy and there was a bit of wind. This made the surface of the water slightly wavy and caused the canoe to drift in certain areas of the lake. We began monitoring at the boat landing and paddled around the lake in a counter-clockwise direction. Aubrey and I did a complete shoreline scan while meandering in and out with the canoe between different depths. We looked on the shoreline itself and also in the water, noting the plants and animals we had observed in the process.

To observe the water clarity and quality of Bolger Lake, Aubrey and I went to the deep hole towards the middle of the lake. After locating the deep hole with our sonar unit, we used a Secchi

disk to measure water clarity and a dissolved oxygen meter to measure water health. Oxygen is needed for a healthy fish population, and for plants to respire at night. The measurements from the dissolved oxygen meter can tell us if the organisms in the lake are under stress. Both of these measurements were comparable to previous results, and there should be no concern for the water health on Bolger Lake. The Secchi disk reading was 11 feet, and the dissolved oxygen readings can be found in table 2.

Aubrey and I did observe one Chinese Mystery Snail in the sand at the boat landing at Bolger Lake, however, this invasive was already known to have been established here. Besides this invasive being present, Bolger Lake still had many native plants and animals present and thriving. The four most common plants we observed were White Water Lily, Pitcher Plant, Pickerel Weed, and Bullhead Pond Lily. These plants can be seen below in table 1.

Findings: Taken 11:00 a.m. – 12:30 p.m. on August 5th, 2020

Aquatic Invasive Species:

One Chinese Mystery Snail was found near the boat landing.

Secchi: The Secchi reading on this lake was 11 feet out of a 45 foot maximum depth. The water looked clear and dark blue in color, and the surface was a little wavy due to some wind.

Dissolved Oxygen: These measurements can be seen in Table 2.

Figure 1. Map of Oneida County, WI with Bolger Lake circled in red (approximate location)



Figure 2. Map of Buffalo Lake with boat landing and location of Secchi disk reading labeled.



-  Deep hole and location of Secchi disk reading
-  Boat landing



Table 1. Plants found in Bolger Lake while monitoring.





<p>Common Name Scientific Plant Name</p>	<p>Description</p>	<p>Image</p>
<p>Pickereel Weed <i>Pontederia cordata</i></p>	<p>An aquatic plant with thin, bright green leaves. Emergent leaves tend to be arrow shaped with 6 parted, blue flowers. This plant is native.</p>	 <p>Photo Credit: ediblewildfood.com</p>
<p>White Water Lily <i>Nymphaea odorata</i></p>	<p>An aquatic plant that has large, round leaves that can grow to be 12 inches in diameter. White water lilies also have large, white flowers with many petals. This plant is native.</p>	 <p>Photo Credit: Stephanie Boismenu</p>
<p>Bullhead Pond Lily <i>Nuphar variegata</i></p>	<p>An aquatic plant with heart-shaped leaves that can grow to be 15 inches long. This plant also has a yellow, cup-shaped flower. This plant is native.</p>	 <p>Photo Credit: Jomegat's Weblog</p>
<p>Pitcher Plant <i>Sarracenia purpurea</i></p>	<p>A wetland plant that has a very characteristic "pitcher" or cup-shaped leaf. Insects climb down into these leaves and become entrapped by fluid and sticky hairs. Once the insect dies it is slowly ingested by the plant. This is native.</p>	 <p>Photo Credit: Stephanie Boismenu</p>

Table 2. Dissolved oxygen levels and temperatures at the deep hole in Bolger Lake.

Depth (Feet)	Dissolved Oxygen Levels (mg/L)	Temperature (F)	Percent Dissolved Oxygen
2	8.40	73.7	103.5
4	8.4	73.4	103.2
6	8.39	73.2	102.9
8	8.40	73.0	102.8
10	8.32	72.9	101.7
12	8.26	72.8	100.9
14	8.24	72.6	100.5
16	8.24	72.6	100.5
18	10.0	70.0	118.5
20	10.66	64.9	119.4
22	10.12	60.9	108.2
24	9.01	56.7	91.6
26	7.76	54.4	76.6
28	2.7	52.4	26.0
30	0.27	50.8	2.6
32	0.17	50.0	1.6
34	0.12	49.3	1.1
36	0.1	48.6	0.9
38	0.09	47.9	0.8
40	0.08	47.3	0.7
42	0.08	47.1	0.7



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Bolger Lake AIS Monitoring and Water Clarity Report

WBIC: 973000
Previous AIS Findings: None
New AIS Findings: Chinese Mystery Snails
Field Date: July 1, 2015
Field Crew: Stephanie Boismenu and Samantha Zommers, AIS Project Assistants, Oneida County Land and Water Conservation Department
Report By: Samantha Zommers

Stephanie and I monitored Bolger Lake on Wednesday July 1, 2015. This is a 115 acre lake located off of Highway 51 near Hazelhurst, WI (Figure 1). This is a seepage lake that has a trophic status of oligotrophic with a 65% sand, 5% gravel, 15% rock, and 15% muck bottom. Oligotrophic lakes are characterized by a low amount of nutrients, limiting the amount of plants and algae, and they often have increased dissolved oxygen levels. This lake has minimal vegetation with excellent water clarity which helped us evaluate the plants while looking for any invasive species. Bolger Lake has one public boat landing and is bordered in part by the Bearskin State Trail.

We entered Bolger Lake using the landing on Bolger Lake Road as seen on the map in Figure 3. Then using the bathymetric map (Figure 2) we found the deep hole in the lake to take water quality measurements. At this point we put down the anchor, took GPS coordinates, and obtained measurements on water clarity with the Secchi disk and the dissolved oxygen meter (Table 1).

After data collection, we paddled to five locations of the lake shore to perform an AIS presence/absence check. The protocol for this process is to complete a visual inspection of the littoral zone along 100 feet of the shoreline in each area. We chose five areas around private landings, private docks with motorized watercrafts, and the public boat landing (Figure 3). For the five locations of AIS presence/absence checks, we meandered the shoreline via walking along the shoreline, looking through vegetation, and checking under and around solid surfaces. For one of the locations, Stephanie snorkeled the area to perform a more in-depth survey of the area. In addition to the five presence/absence checks, we also visually inspected the entire shoreline of the lake.

Findings:

Aquatic Invasive Species:

Chinese mystery snails were newly discovered on the day of monitoring. There were both empty shells and live specimens found. GPS coordinates of the Chinese mystery snails can be seen in Figure 4.

Dissolved Oxygen:

These measurements can be found on Table 1.

Secchi:

The Secchi reading on this lake was 16 feet out of a 45 foot max depth.

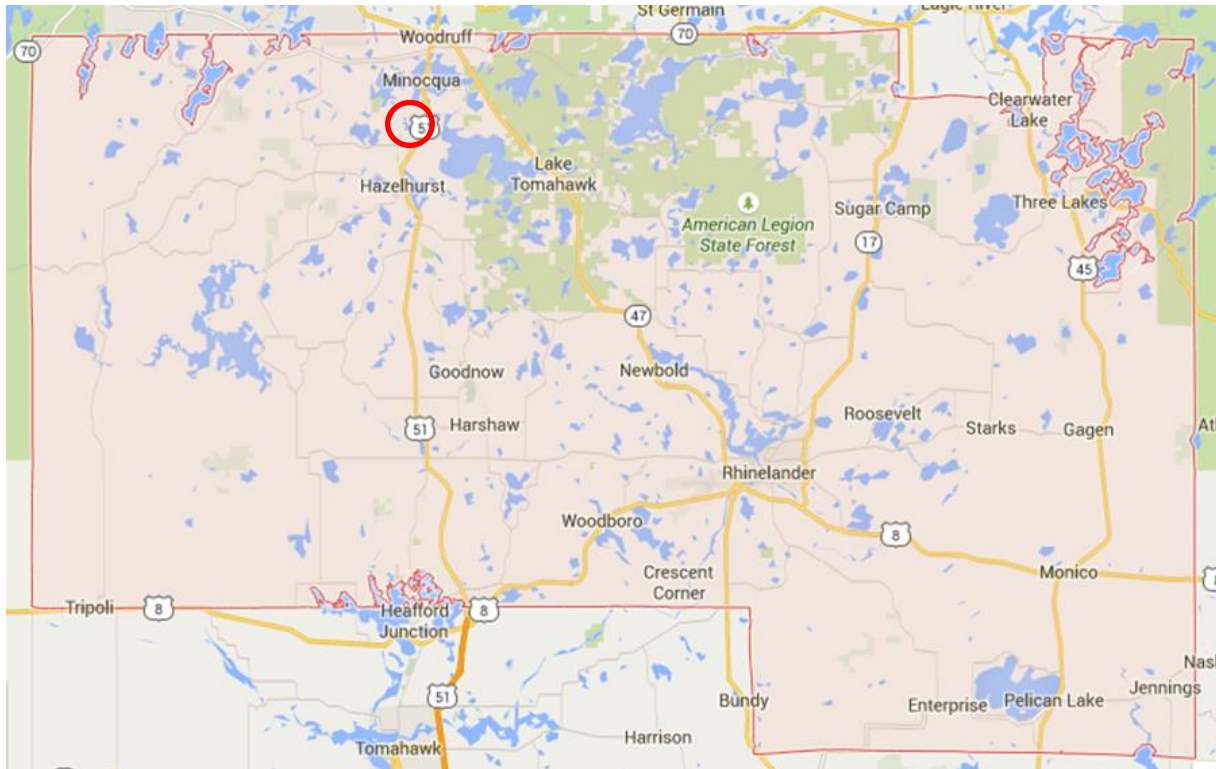


Figure 1. Map of Oneida County, WI with Bolger Lake circled.

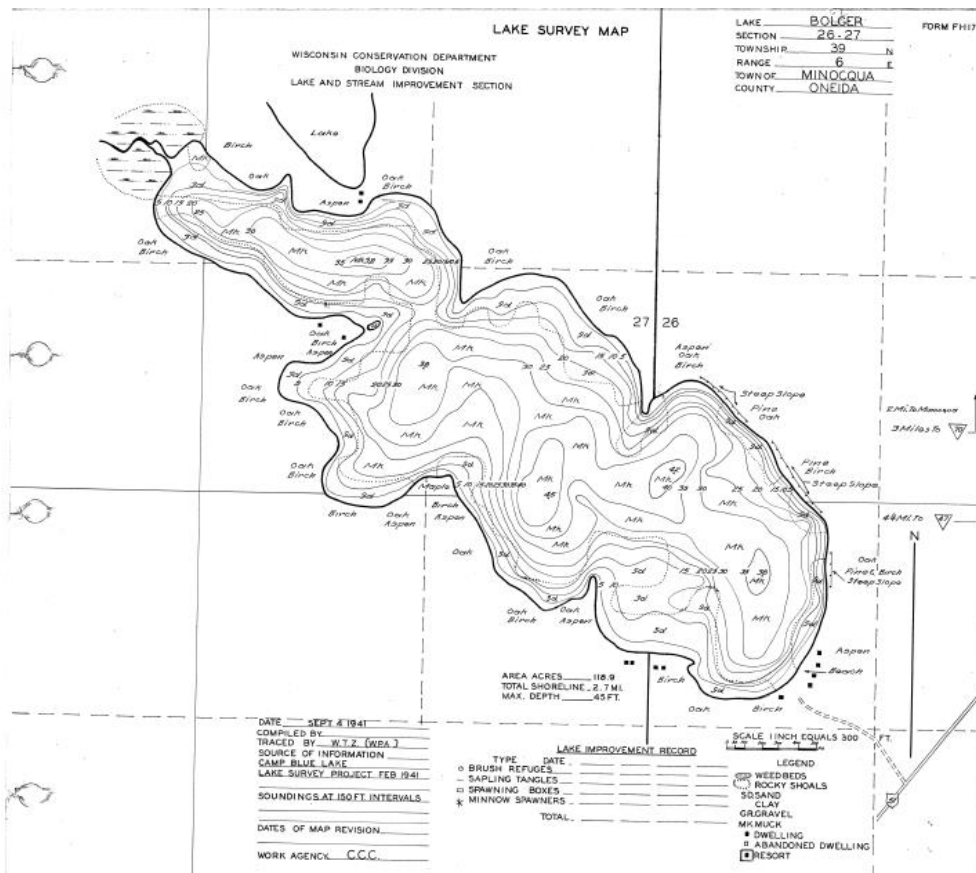


Figure 2. Bathymetric map of Bolger Lake in Oneida County, WI.

Map Source: Wisconsin Department of Natural Resources 608-266-2621, Bolger Lake – Oneida County, Wisconsin – DNR Lake Map, Date – September 4, 1941 – Historical Lake Map

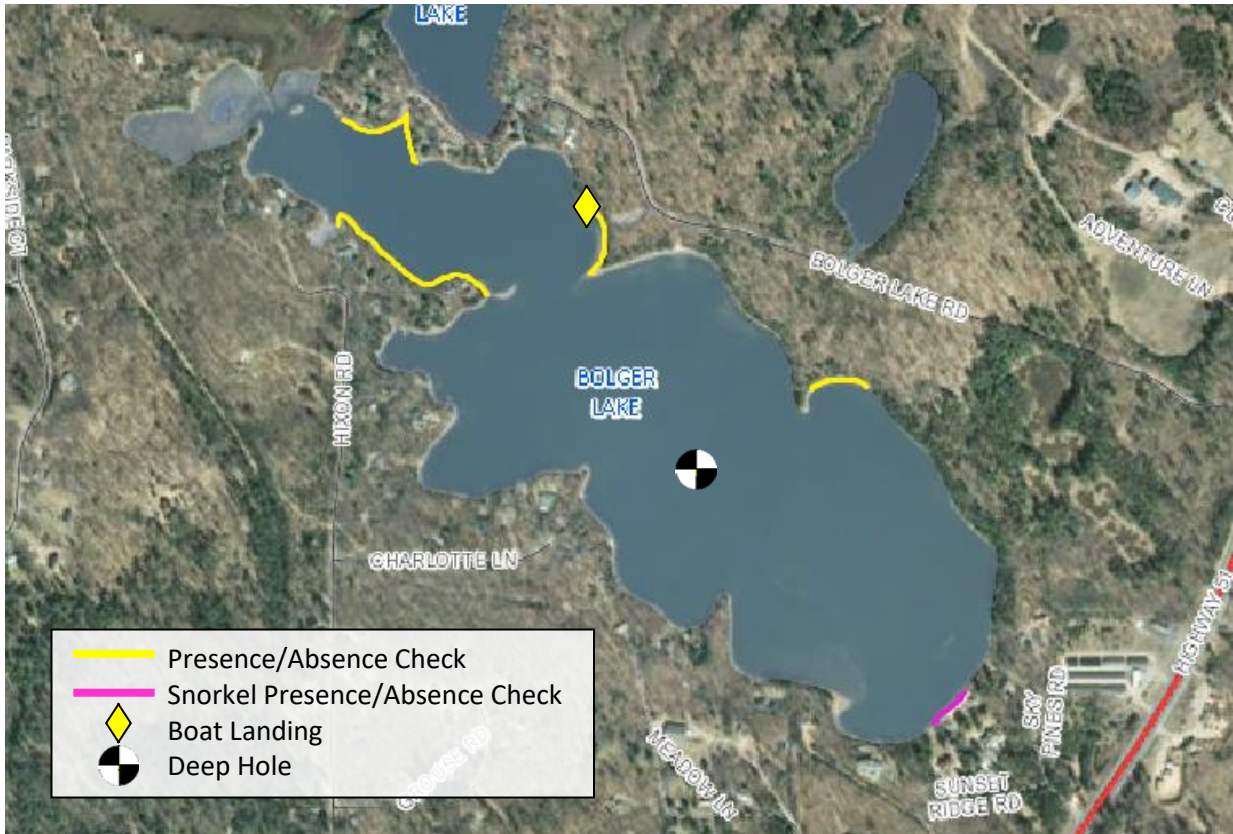


Figure 3. Map of Bolger Lake with the site of the deep hole, boat landing, and locations of AIS presence/absence checks.

Deep Hole GPS Coordinates: 45.841409, -89.718648



Figure 4. Map of Bolger Lake with new AIS discoveries.

Chinese Mystery Snail GPS Coordinates: 45.83769, -89.71366

Table 1. Dissolved oxygen levels and temperatures.

Depth (Feet)	Dissolved Oxygen Levels (mg/L)	Temperature (°F)
2	9.36	70.5
4	9.35	70.5
6	9.25	70.4
8	9.33	70.4
10	9.36	70.4
12	9.34	70.3
14	9.26	70.2
16	9.31	70.2
18	10.16	67.5
20	10.90	64.3
22	10.99	61.2
24	11.31	57.6
26	11.11	55.7
28	10.87	53.9
30	9.62	52.0
32	6.69	50.3
34	4.06	49.4

Resources: <http://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=973000&page=facts>